

WHAT IS CLAIMED IS:

Claim 1: A method for analyzing agonist activity to a cytokinin receptor, which comprises (1) bringing an examinee substance into contact with a transformed cell into which DNA coding the cytokinin receptor is introduced and (2) measuring the existence or the quantity of intracellular signal transduction from the cytokinin receptor expressed in the transformed cell.

Claim 2: The method according to claim 1, wherein the transformed cell is a cell having a function of directly controlling the cell growth by intracellular signal transduction from the cytokinin receptor and the measurement of the existence or the quantity of the intracellular signal transduction is carried out using the quantity of the cell growth of the transformed cell as an indicator.

Claim 3: The method according to claim 1, wherein the transformed cell is a transformed cell generated by introducing DNA coding the cytokinin receptor into a host cell so improved as to have histidine kinase activity lower than the intrinsic histidine kinase activity of the host cell.

Claim 4: The method according to claim 1, wherein the transformed cell is a transformed cell generated by introducing DNA coding the cytokinin receptor into a host cell so improved as to have histidine kinase activity lower than the intrinsic histidine kinase activity of the host cell by deleting one or more of histidine kinase.

Claim 5: The method according to claim 1, wherein the transformed cell is a transformed cell generated by introducing DNA coding the cytokinin receptor into a host cell having no cytokinin receptor.

Claim 6: The method according to claim 1, wherein the transformed cell is yeast.

Claim 7: The method according to claim 1, wherein the transformed cell is budding yeast.

Claim 8: The method according to claim 1, wherein the DNA coding the cytokinin receptor is any one of DNA coding the cytokinin receptor selected from:

- (a) a cytokinin receptor having the amino acid sequence represented by SEQ ID No: 6;
- (b) a cytokinin receptor having the amino acid sequence represented by SEQ ID No: 2;
- (c) a cytokinin receptor having the amino acid sequence represented by SEQ ID No: 4;
- (d) a cytokinin receptor wherein said cytokinin receptor has at least one transmembrane region but less than that in its natural form.
- (e) a cytokinin receptor having the amino acid sequence from amino acid number 196 to 1176 among the amino acid sequence represented by SEQ ID No: 2;
- (f) a cytokinin receptor having the amino acid sequence from amino acid number 50 to 1176 among the amino acid sequence represented by SEQ ID No: 2;
- (g) a cytokinin receptor having the amino acid sequence from amino acid number 32 to 1036 among the amino acid sequence represented by SEQ ID No: 4;
- (h) a chimera-type cytokinin receptor comprising extracellular regions of the

cytokinin receptor, transmembrane regions of the cytokinin receptor, and histidine kinase regions of the cytokinin receptor, wherein each of the regions is a homogeneous region to one another and receiver regions for the histidine kinase, which are heterogeneous regions to these regions; and (i) a cytokinin receptor having the amino acid sequence with deletion, substitution, or addition of one or a plurality of amino acids in the amino acid sequence of the cytokinin receptor of (a), (b), (c), (e), (f), or (g).

Claim 9: A method for analyzing antagonist activity to a cytokinin receptor, which comprises (1) bringing an examinee substance and a substance having agonist activity to the cytokinin receptor into contact with a transformed cell into which DNA coding the cytokinin receptor is introduced and (2) measuring the existence or the quantity of intracellular signal transduction from the cytokinin receptor expressed in the transformed cell.

Claim 10: The method according to claim 9, wherein the transformed cell is a cell having a function of directly controlling the cell growth by intracellular signal transduction from the cytokinin receptor and the measurement of the existence or the quantity of the intracellular signal transduction is carried out using the quantity of the cell growth of the transformed cell as an indicator.

Claim 11: The method according to claim 9, wherein the transformed cell is a transformed cell generated by introducing DNA coding the cytokinin receptor into a host cell so improved as to have histidine kinase activity lower than the intrinsic histidine kinase activity of the host cell.

Claim 12: The method according to claim 9, wherein the transformed

cell is a transformed cell generated by introducing DNA coding the cytokinin receptor into a host cell so improved as to have histidine kinase activity lower than the intrinsic histidine kinase activity of the host cell by deleting one or more of histidine kinase.

Claim 13: The method according to claim 9, wherein the transformed cell is a transformed cell generated by introducing DNA coding the cytokinin receptor into a host cell having no cytokinin receptor.

Claim 14: The method according to claim 9, wherein the transformed cell is yeast.

Claim 15: The method according to claim 9, wherein the transformed cell is budding yeast.

Claim 16: The method according to claim 9, wherein the DNA coding the cytokinin receptor is any one of DNA coding the cytokinin receptor selected from:

- (a) a cytokinin receptor having the amino acid sequence represented by SEQ ID No: 6;
- (b) a cytokinin receptor having the amino acid sequence represented by SEQ ID No: 2;
- (c) a cytokinin receptor having the amino acid sequence represented by SEQ ID No: 4;
- (d) a cytokinin receptor wherein said cytokinin receptor has at least one transmembrane region but less than that in its natural form.
- (e) a cytokinin receptor having the amino acid sequence from amino acid number 196 to 1176 among the amino acid sequence represented by SEQ ID No: 2;

(f) a cytokinin receptor having the amino acid sequence from amino acid number 50 to 1176 among the amino acid sequence represented by SEQ ID No: 2;

(g) a cytokinin receptor having the amino acid sequence from amino acid number 32 to 1036 among the amino acid sequence represented by SEQ ID No: 4;

(h) a chimera-type cytokinin receptor comprising extracellular regions of the cytokinin receptor, transmembrane regions of the cytokinin receptor, and histidine kinase regions of the cytokinin receptor, wherein each of the regions is a homogeneous region to one another and receiver regions for the histidine kinase, which are heterogeneous regions to these regions; and

(i) a cytokinin receptor having the amino acid sequence with deletion, substitution, or addition of one or a plurality of amino acids in the amino acid sequence of the cytokinin receptor of (a), (b), (c), (e), (f), or (g).

Claim 17: A cytokinin receptor selected from:

(d) a cytokinin receptor wherein said cytokinin receptor has at least one transmembrane region but less than that in its natural form.

(e) a cytokinin receptor having the amino acid sequence from amino acid number 196 to 1176 among the amino acid sequence represented by SEQ ID No: 2;

(f) a cytokinin receptor having the amino acid sequence from amino acid number 50 to 1176 among the amino acid sequence represented by SEQ ID No: 2;

(g) a cytokinin receptor having the amino acid sequence from amino acid number 32 to 1036 among the amino acid sequence represented by SEQ ID

No: 4;

- (h) a chimera-type cytokinin receptor comprising extracellular regions of the cytokinin receptor, transmembrane regions of the cytokinin receptor, and histidine kinase regions of the cytokinin receptor, wherein each of the regions is a homogeneous region to one another and receiver regions for the histidine kinase, which are heterogeneous regions to these regions; and
- (i) a cytokinin receptor having the amino acid sequence with deletion, substitution, or addition of one or a plurality of amino acids in the amino acid sequence of the cytokinin receptor of (e), (f), or (g).

Claim 18: DNA coding the cytokinin receptor of claim 17.

Claim 19: A transformed cell into which DNA of claim 18 is introduced.

Claim 20: A method for detecting agonist-activity to a cytokinin receptor, which comprises evaluating the agonist-activity of two or more different examinee substances to the cytokinin receptor based on the difference obtained by comparison of the existence or the quantity of the intracellular signal transduction in a section where the examinee substances are independently used and measured by the analysis method of claim 1.

Claim 21: The method according to claim 20, wherein at least one substance among the two or more different examinee substances is a substance having no agonist-activity to the cytokinin receptor.

Claim 22: A method for searching agonist-active substance to a cytokinin receptor, which comprises selecting a substance having agonist-activity to a cytokinin receptor based on the agonist-activity to a

cytokinin receptor evaluated by the detecting method of claim 20.

Claim 23: A plant growth regulator comprising the substances selected by the searching method of claim 22 as an active ingredient.

Claim 24: A method for detecting antagonist-activity to a cytokinin receptor, which comprises evaluating the antagonist-activity of two or more different examinee substances to the cytokinin receptor based on the difference obtained by comparison of the existence or the quantity of the intracellular signal transduction in a section where the examinee substances are independently used and measured by the analysis method of claim 9.

Claim 25: The method according to claim 24, wherein at least one substance among the two or more different examinee substances is a substance having no antagonist-activity to the cytokinin receptor.

Claim 26: A method for searching antagonist-active substance to a cytokinin receptor, which comprises selecting a substance having antagonist-activity to a cytokinin receptor based on the antagonist-activity to a cytokinin receptor evaluated by the detecting method of claim 24.

Claim 27: A plant growth regulator comprising the substances selected by the searching method of claim 26 as an active ingredient.